IDRC FEATURE

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CANADA

Biological control methods are gaining in popularity in the People's Republic of China as in many other parts of the world. In the following two short articles, Song Ming of China Features describes how spiders and fish are being enlisted to help fight insect pests.

Words: 492 approx.

THE EIGHT-LEGGED INSECTICIDE

by SONG MING

Alongside ducklings and frogs, spiders are being used as powerful insect killers on the rice lands in south China.

Experiments in Hunan, a major rice-growing province, show that, in only six days, the eight-legged spinning creature can kill 80 to 90 percent of the harmful insects in rice fields, even when outnumbered 20 to 1. Spiders are particularly effective against rice hoppers, leaf cicadas, and rice leaf rollers.

Hunan started the experiment in 1976 on 20 hectares of land. By 1978, the area of experimentation had been expanded to 65 000 hectares. The increased use of "natural" methods of fighting harmful insects mean that less chemical pesticides are used, while increasing rice yields.

The peasants of this area used to employ insecticides to combat insect pests, leading to water and air pollution, and subjecting people and animals to unnecessary and harmful poisons. The prolonged use of insecticides also caused insect resistance, and killed spiders and other insects beneficial to crops.

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Surveys by biologists in various localities show that many kinds of spiders are the natural enemy of rice pests, and they have collected 125 specimens from 18 provinces and one municipality to help prove their case. Of these, ten species have been shown to be the most effective: the small black spider (*Erigomdium graminitoloum*), the spotted spider (*Theridion octomaculatum*), the round-grain spider (*Lycosa pseudoannulata*), and the drab spider (*Neoscona doenitzi*) are only four examples.

These spiders can be found on leaves, stalks, and water weeds, and they often can be seen skipping over the surface of stagnant water, or running up and down rice stalks to kill insects. Some of them spin webs between rice stalks to wrap their preys in sticky threads before devouring them one by one.

In an indoor test conducted by biologists in Hunan province's Lingxian county, it was found that each spider swallowed an average of 15.7 leaf cicadas and plant hoppers a day. The spider's diet consists exclusively of insects and it can go for a month or more without food.

Female spiders lay their eggs on rice stalks and water weeds, and in earth holes. In their one to two year life span, female spiders lay between 50 to 100 eggs, on about 14 different occasions.

China is trying to carry out a policy of "comprehensive prevention and treatment, with emphasis on the former" for plant protection. In recent years, biological means of pest control have been employed on a large scale with heartening results.

Among China's other achievements in this area are the wide use of indoor-bred ladybirds and lacewings for killing cotton aphids and cotton bollworms. In some areas, the peasants have employed parasitic wasps to control a wide range of vermin including maize, rice, and sugarcane borers, apple tortrixes, and pine caterpillars.

All of these biological means are generally more effective than insecticides, and show a healthy trend in China's comperhensive plant protection program.

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AN EDIBLE MOSQUITO TRAP

by SONG MING

From time immemorial, fish have been raised for the table in China — but now a method has been developed to use them for destroying mosquitoes in paddy fields.

Experiments carried out by an office headed by Professor Su Shouzhi of Henan Medical College have shown that the presence of grass carp and other fish in paddy fields and irrigation ditches has resulted in an 80 to 90 percent reduction in the density of mosquitoes and their larvae in ten rice-growing counties in Henan province. This method of combatting mosquitoes has now been introduced in many places in Jiangsu, Anhui, Hubei and Shandong provinces.

Breeding fish in paddy fields is a simple operation. First, a one-metre-square hole, half a metre deep, is dug in the middle of a rice field. Branching out of the hole are four small ditches 28 cm deep. Fish from commune-run hatcheries are set free in the fields when the rice seedlings have turned green. Since they are by then quite tall, the small fish cannot nibble at the leaves. The fish can retire to the hole when peasants drain the water from the field to sun the soil, or in times of drought when the water is not sufficiently deep to flood the field.

While devouring mosquito larvae and other harmful insects, the fish also help to free the paddies from weeds.

Of the 1000 or so varieties of mosquitoes in the world, more than 200 are found in China, including those that carry malaria, filariasis, and encephalitis.

In the years just before and after the Second World War, D.D.T. and other chemicals were used with considerable success in mosquito-eradication campaigns in many parts of the world. But, according to statistics released by the World Health Organization in 1975, the use of chemicals resulted in

environmental pollution and built up drug-resistance in 108 varieties of mosquitoes. So experts began to search for new ways to deal with the scourge.

In 1972, in collaboration with medical workers and peasants in Luyi county, East Henan province, Professor Su and his colleagues began experimenting with fish. The professor found that some mosquitoes lay their eggs on water weeds for hatching in spring and summer. Six to seven generations of this insect can be bred in a year. A female Anopheles mosquito lays eggs eight or nine times in its lifetime, producing between 200 to 300 eggs on each occasion. They dissected grass carp and found that each fish could devour about 370 mosquito larvae a day.

Fish fry were set free in the paddy fields in August that year and by November of the following year, a 92.3 percent reduction in the density of mosquitoes had been noted.

Professor Su, 60, has been teaching for 29 years in Henan Medical College. He is also a leading member of a central office set up in 1965 to direct the fight against snail fever (*schistosomiasis*).

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